

**Remarks/Arguments:**

**Status of Claims**

Claims 2-16 and 18-26 are pending in the application and have been rejected.

**Discussion with Examiner**

The applicant thanks the Examiner for agreeing to contact the applicant's attorney by telephone to discuss this Amendment, if for any reason the application is not deemed to be in condition for allowance after entry of the amendment.

**Claim Rejections**

The Office Action rejects claims 3-7, 18, 23, and 24 under 35 U.S.C. § 103(a) as being unpatentable over Eloy (U.S. Patent No. 6,275,045) in view of Wu et al. (Applied Physics Letters, 67: 3523-3525, 1995), and Bromage et al. (U.S. Patent No. 6,239,866). The other pending claims are rejected as unpatentable over the above references further in view of additional references as follows: claims 2, 10, 11, 19, and 20 in further view of Cai et al. (Applied Physics Letters, 73:444-446, 1998); claims 8, 9, 25 and 26 in further view of Mittleman et al. (U.S. Patent No. 6,078,047); claims 12, 13, 21, and 22 in further view of Cai and Mittleman; and claims 14-16 in further view of Cai, Onstott et al. (U.S. Patent No. 4,896,942), and Nahata et al. (Applied Physics Letters, 69:2321-2323, 1996). The applicants respectfully traverse all of these rejections.

Independent claim 4 contains a combination of limitations including "a chopper for modulating the terahertz output pulses by alternately transmitting and reflecting the pulses at a first frequency, the chopper having a clock output and *positioned between the transceiver and an object* such that terahertz output pulses *reflected by the chopper* have a *polarity opposite* terahertz output pulses reflected by the object." Independent claim 18 contains a combination of steps including "modulating the terahertz frequency output pulse with a chopper *positioned between the transceiver device and an object* to be illuminated with the modulated

terahertz frequency output pulses, the chopper alternately transmitting and reflecting the pulses" and "illuminating the object with terahertz frequency output pulses transmitted by the chopper so that the object reflects terahertz pulses having an *opposite polarity* from terahertz pulses *reflected by the chopper*." All of the other claims in the application depend directly or indirectly from claims 4 and 18. Accordingly, because the combinations recited in claims 4 and 18 are not shown in the prior art, all of the claims should be allowed.

The Office Action responds to the applicant's previous response by noting that "the features upon which the applicant relies (i.e., (a) reflective chopper blade and (b) chopper position) are not recited in the rejected claim(s)" and that "the scope of the claims encompass any chopper (e.g. an attenuator) at any position." The claims, as amended, now recite that the chopper (1) reflects terahertz pulses and (2) is located between the pulse generator and the object to be illuminated by the pulses, and furthermore (3) that the pulses reflected by the chopper have an opposite polarity from pulses reflected by the object. Accordingly, the scope of the claims no longer encompasses any attenuator at any position, but rather recites characteristics of the chopper and the placement of the chopper. These limitations are not taught or suggested in the prior art.

The Office Action cites a combination of the Eloy reference for teaching use of a transceiver generally; the Wu, Nahata, and Cai references for teaching the use of a chopper generally; and the Bromage reference for teaching modulation of THz pulses generally. There is no motivation, however, to combine these references in the specific manner claimed by the applicant, except in hindsight in view of the applicant's application. Furthermore, none of the cited references, alone or in combination, teach the combination of limitations claimed by the applicant, specifically the combination of limitations relating to characteristics and placement of the chopper relative to the other components in the system.

Bromage discloses the use of a Si:Ga:As attenuator having specific characteristics. Col. 3, lines 26-42. There is no suggestion in the Bromage reference that a *chopper* capable of alternately transmitting and reflecting a terahertz pulse could be substituted for the attenuator so characterized. Furthermore, there is no suggestion in the cited references to locate a chopper between the THz pulse generator and the object to be illuminated at all, let

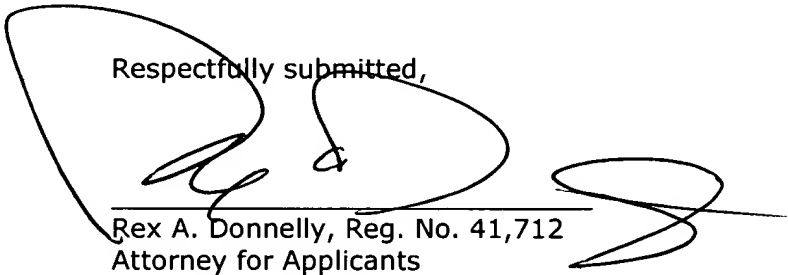
alone to locate the chopper such that the pulses reflected by the chopper have a different polarity than the pulses reflected by the object being illuminated. Bromage teaches the use of an attenuator on the THz pulse, whereas Wu, Nahata, and Cai merely teach the use of a chopper on the pump or probe beam.

Thus, there is no motivation to combine Bromage with Wu, Nahata, or Cai, and even if the references are combined, the combined references fail to teach the combination of limitations claimed by the applicant. Accordingly, the applicants respectfully submit that claims 4 and 18 are allowable over the cited art, and consequently, all of the pending claims should be allowed at least as dependent upon allowable base claims.

### **Conclusions**

The applicants respectfully submit that this response overcomes each of the rejections set forth in the Office Action and that the application should now be allowed. The Examiner is invited to call the applicants' undersigned representative, however, if any further amendment will expedite the prosecution of the application or if the Examiner has any suggestions or questions concerning the application or the present Response or its enclosures.

Respectfully submitted,



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